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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/987,345	11/14/2001	Takeshi Konno	107443-00014	6928

32294 7590 11/30/2005

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EXAMINER	
HUSON, MONICA A	
ART UNIT	**PAPER NUMBER**
1732	

DATE MAILED: 11/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	09/987,345	KONNO, TAKESHI	
	Examiner	Art Unit	
	Monica A. Huson	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 September 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to the Amendment filed 15 September 2005.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-4 and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al. (U.S. Patent 4,879,077), in view of Okushima (U.S. Patent 5,194,195), further in view of Akira (JP 61-121921).

Regarding Claim 1, Shimizu shows the basic process, including controlling an injection molding machine including a heating cylinder and a screw disposed in the heating cylinder (Column 3, lines 46-47), performing a plasticization/measuring process and an injection process (Column 2, lines 60), defining a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a constant speed of the screw (Figures 3-5; Column 2, lines 58-65), and defining a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are

perfectly synchronized. The examiner also notes that Shimizu does not explicitly define an arbitrary synchronization ratio, as used in the claimed formula. However, since the arbitrary synchronization ratio cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.). Shimizu does not show controlling a density distribution of molten resin at a nose portion of the screw. Okushima shows that it is known to move the screw backwards while rotating it after completion of the measuring process or the injection process (Column 4, lines 12-13) and to control a density distribution of molten resin at a nose portion of the screw (Column 3, lines 28-30; It is noted that if the density is uniform, there is an equal distribution of density.). Okushima and Shimizu are combinable because they are concerned with a similar technical field, namely, methods of controlling injection molding machines. It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Okushima's control parameter during Shimizu's molding process in order to insure formation of an article having desired density characteristics. Shimizu does not explicitly show moving the screw backwards at a constant speed while rotating it after completion of the measuring process or the injection process. Akira shows that it is known to retract the screw at a constant backward speed while rotating it (Abstract). Akira and Shimizu are combinable because they are concerned with a similar technical field, namely, that of injection molding processes having a heated cylinder and a movable screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to move the screw backwards at a constant speed after an injection process, as in Akira, in Shimizu's molding process in order to melt and measure the material more efficiently.

Regarding Claim 2, Shimizu shows the basic process as claimed as discussed above, however Shimizu does not explicitly show variations of the synchronization of the screw rotation and linear movement. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio of the screw's rotation speed and linear speed during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 3, Shimizu shows the basic process as claimed, including a process using a heating cylinder, a screw disposed in a heating cylinder (Column 3, lines 46-47), a first driving source for driving the screw in an axial direction, a second driving source for rotating the screw (Column 4, lines 1-5, 18-27), position detecting means for detecting the axial position of the screw (Column 5, lines 42-51), rotation-speed detecting means for detecting the rotation speed of the screw (Column 4, lines 49-54), and a controller for controlling the first driving source and the second driving source dependent on the detecting signals transmitted from the position detecting means (Column 5, lines 47-51) and the rotation-speed detecting means (Column 4, 60-65). Shimizu also shows a plasticization/measuring process and an injection process (Column 2, lines 60), comprising the steps of, defining a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a constant speed of the screw (Figures 3-5; Column 2, lines 58-65), and defining a

rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. The examiner also notes that Shimizu does not explicitly define an arbitrary sychronization ratio, as used in the claimed formula. However, since the arbitrary sychronization ratio cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.). Shimizu does not show controlling a density distribution of molten resin at a nose portion of the screw. Okushima shows that it is known to move the screw backwards while rotating it after completion of the measuring process or the injection process (Column 4, lines 12-13) and to control a density distribution of molten resin at a nose portion of the screw (Column 3, lines 28-30; It is noted that if the density is uniform, there is an equal distribution of density.). Okushima and Shimizu are combinable because they are concerned with a similar technical field, namely, methods of controlling injection molding machines. It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Okushima's control parameter during Shimizu's molding process in order to insure formation of an article having desired density characteristics. Shimizu does not explicitly show moving the screw backwards at a constant speed while rotating it after completion of the measuring process or the injection process. Akira shows that it is known to retract the screw at a constant backward speed while rotating it (Abstract). Akira and Shimizu are combinable because they are concerned with a similar technical field, namely, that of injection molding processes having a

heated cylinder and a movable screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to move the screw backwards at a constant speed after an injection process, as in Akira, in Shimizu's molding process in order to melt and measure the material more efficiently.

Regarding Claim 4, Shimizu shows the basic process as claimed as discussed above, however Shimizu does not explicitly show variations of the synchronization of the screw rotation and linear movement. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 9, Shimizu shows that it is known to control an injection molding machine in order to control the movement of a molten resin in a heating cylinder of the injection molding machine (Column 2, lines 18-26), the injection molding machine including a screw arranged within the heating cylinder to be rotatable and to be linearly movable (Column 2, lines 43-48) and having a flight of pitch P (Column 2, line 51), the molten resin being moved in a forward feeding direction during a plasticization process and an injection process (Column 2, lines 43-65). Shimizu does not show controlling a density distribution of molten resin at a nose portion of the screw. Okushima shows that it is known to move the screw backwards while rotating it after completion of the measuring process or the injection process (Column 4, lines

12-13) and to control a density distribution of molten resin at a nose portion of the screw (Column 3, lines 28-30; It is noted that if the density is uniform, there is an equal distribution of density.). Okushima and Shimizu are combinable because they are concerned with a similar technical field, namely, methods of controlling injection molding machines. It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Okushima's control parameter during Shimizu's molding process in order to insure formation of an article having desired density characteristics. Shimizu does not explicitly show moving the screw backwards at a constant speed while rotating it after completion of the measuring process or the injection process. Akira shows that it is known to retract the screw at a constant backward speed while rotating it (Abstract). Akira and Shimizu are combinable because they are concerned with a similar technical field, namely, that of injection molding processes having a heated cylinder and a movable screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to move the screw backwards at a constant speed after an injection process, as in Akira, in Shimizu's molding process in order to melt and measure the material more efficiently.

Regarding Claim 10, Shimizu shows the process as claimed as discussed above, including showing that it is known to control an injection molding operation by performing a plasticization/measuring process and an injection process (Column 2, lines 18-26). Shimizu also shows that it is known to define a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a speed of the screw (Column 2, lines 58-65), and to define a rotation speed of the screw by dividing the linear (backward, as in Yamazaki) speed of the screw by the pitch of the flight of the screw (Column 2,

lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. It would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio of the screw's rotation speed and linear speed during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 11, Shimizu shows the process as claimed as discussed above, including showing that it is known to define a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). Furthermore, the examiner also notes that Shimizu does not explicitly define a synchronization ratio, as used in the formula in Claim 11. However, since the synchronization ratio of Claim 11 cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.).

Regarding Claim 12, Shimizu shows the process as claimed as discussed above, including showing that it is known to define a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a speed of the screw (Column 2, lines 58-65). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the

art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. It would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio of the screw's rotation speed and linear speed during his molding process in order to achieve better measuring and melting of the material therein.

Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al. (U.S. Patent 4,879,077), in view of Okushima (U.S. Patent 5,194,195).

Regarding Claim 5, Shimizu shows the basic process as claimed, including controlling an injection molding machine including a heating cylinder and a screw disposed in the heating cylinder (Column 3, lines 46-47), performing a plasticization/measuring process and an injection process (Column 2, line 60), defining a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a constant linear backward speed of the screw (Column 2, lines 58-65), and defining a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are

perfectly synchronized. The examiner also notes that Shimizu does not explicitly define an arbitrary sychronization ratio, as used in the claimed formula. However, since the arbitrary sychronization ratio cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.). Shimizu does not show controlling a density distribution of molten resin at a nose portion of the screw. Okushima shows that it is known to move the screw backwards while rotating it after completion of the measuring process or the injection process (Column 4, lines 12-13) and to control a density distribution of molten resin at a nose portion of the screw (Column 3, lines 28-30; It is noted that if the density is uniform, there is an equal distribution of density.). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Okushima's control parameter during Shimizu's molding process in order to insure formation of an article having desired density characteristics. Furthermore, Shimizu shows the basic process as claimed as discussed above, but does not explicitly show variations of the synchronization of the screw rotation and linear movement. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 6, Shimizu shows the basic process as claimed as discussed above, however Shimizu does not explicitly show variations of the synchronization of the screw rotation

and linear movement. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 7, Shimizu shows the basic process as claimed, including a process using a heating cylinder, a screw disposed in a heating cylinder (Column 3, lines 46-47), a first driving source for driving the screw in an axial direction, a second driving source for rotating the screw (Column 4, lines 1-5, 18-27), position detecting means for detecting the axial position of the screw (Column 5, lines 42-51), rotation-speed detecting means for detecting the rotation speed of the screw (Column 4, lines 49-54), and a controller for controlling the first driving source and the second driving source dependent on the detecting signals transmitted from the position detecting means (Column 5, lines 47-51) and the rotation-speed detecting means (Column 4, 60-65). Shimizu also shows a plasticization/measuring process and an injection process (Column 2, line 60), comprising the steps of defining a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a constant linear backward speed of the screw (Column 2, lines 58-65), and defining a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill

in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. The examiner also notes that Shimizu does not explicitly define an arbitrary synchronization ratio, as used in the claimed formula. However, since the arbitrary sychronization ratio cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.). Okushima shows that it is known to move the screw backwards while rotating it after completion of the measuring process or the injection process (Column 4, lines 12-13) and to control a density distribution of molten resin at a nose portion of the screw (Column 3, lines 28-30; It is noted that if the density is uniform, there is an equal distribution of density.). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Okushima's control parameter during Shimizu's molding process in order to insure formation of an article having desired density characteristics. Furthermore, Shimizu shows the basic process as claimed as discussed above, but does not explicitly show variations of the synchronization of the screw rotation. However it would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio during his molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 8, Shimizu shows the basic process as claimed as discussed above, however Shimizu does not explicitly show variations of the synchronization of the screw

rotation. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to realize that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw and that if the synchronization ratio is more than 100%, the screw is rotated faster than the backward speed of the screw. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary Shimizu's synchronization ratio during his molding process in order to achieve better measuring and melting of the material therein.

Response to Arguments

Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica A. Huson whose telephone number is 571-272-1198. The examiner can normally be reached on Monday-Friday 7:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Colaianni can be reached on 571-272-1196. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Monica A Huson
Monica A Huson
November 28, 2005

Michael P. Colaianni
MICHAEL P. COLAIANNI
SUPERVISORY PATENT EXAMINER